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A New Genus of Acerentomidae (Protura) from North Japan

By

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(Communicated by Yoshinori IMAIZUMI)

Since my monograph on the Japanese Protura (IMADATÉ, 1974) was published, many scientists have kindly co-operated with my faunistic study in various places of the Japanese Islands, and ample materials containing a considerable number of interesting forms new to science have been rapidly accumulated in my laboratory.

The present paper deals with an acerentomid collected in 1976 in a deciduous broadleaved forest in Akita Prefecture, North Japan. This form shows a peculiar combination of fundamental characters from the two genus-groups of acerentomids, *Acerentulus*- and *Acerella*-groups, and warrants a recognition of a new genus.

The present new proturan is dedicated to a field ethnographer, Masumi SUGAE (1754–1829), who did a number of excellent works on actual life and nature based upon exact observations through his tireless surveys made over 40 years, especially in North Japan. His works suggest that he may have often passed the deciduous broadleaved forest, the type-locality of the present new form, about 160 years ago.

I wish to express my hearty thanks to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for kindly reading the original manuscript of the present paper and for giving valuable advice and criticism.

The holo- and allotypes of the present new form are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo, and paratypes are distributed to the collections of the Universitetets Zoologiske Museum, Copenhagen, the Entomological Institute of Academia Sinica, Shanghai, and the Biological Laboratory of Konodai College, Tokyo Medical and Dental University, Ichikawa.

Genus *Sugaentulus* IMADATÉ, nov.

Type-species: *Sugaentulus masumii* IMADATÉ, sp. nov.

Diagnosis. Typical acerentomid. Labial palpus ornamented with a tuft of setae at apex. On foretarsus, dorsal sensilla *t-1* claviform; *t-2* thin; *t-3* small and lanceolate; exterior sensilla *c* situated at about the same row as *b*, but *d* fairly close to *e* at a little proximal to exterior seta γ 3; *f* and *g* very close to each other; interior sensilla *a'* fairly distal to *t-1*, at about the same level as *t-2*; *b'* absent; interior seta β 1 short. Thoraces II–III each with two pair of dorsal anterior setae, A 2 and 4. On abdominal tergites II–VI, posterior principal setae P 3 situated at a little anterior to the other

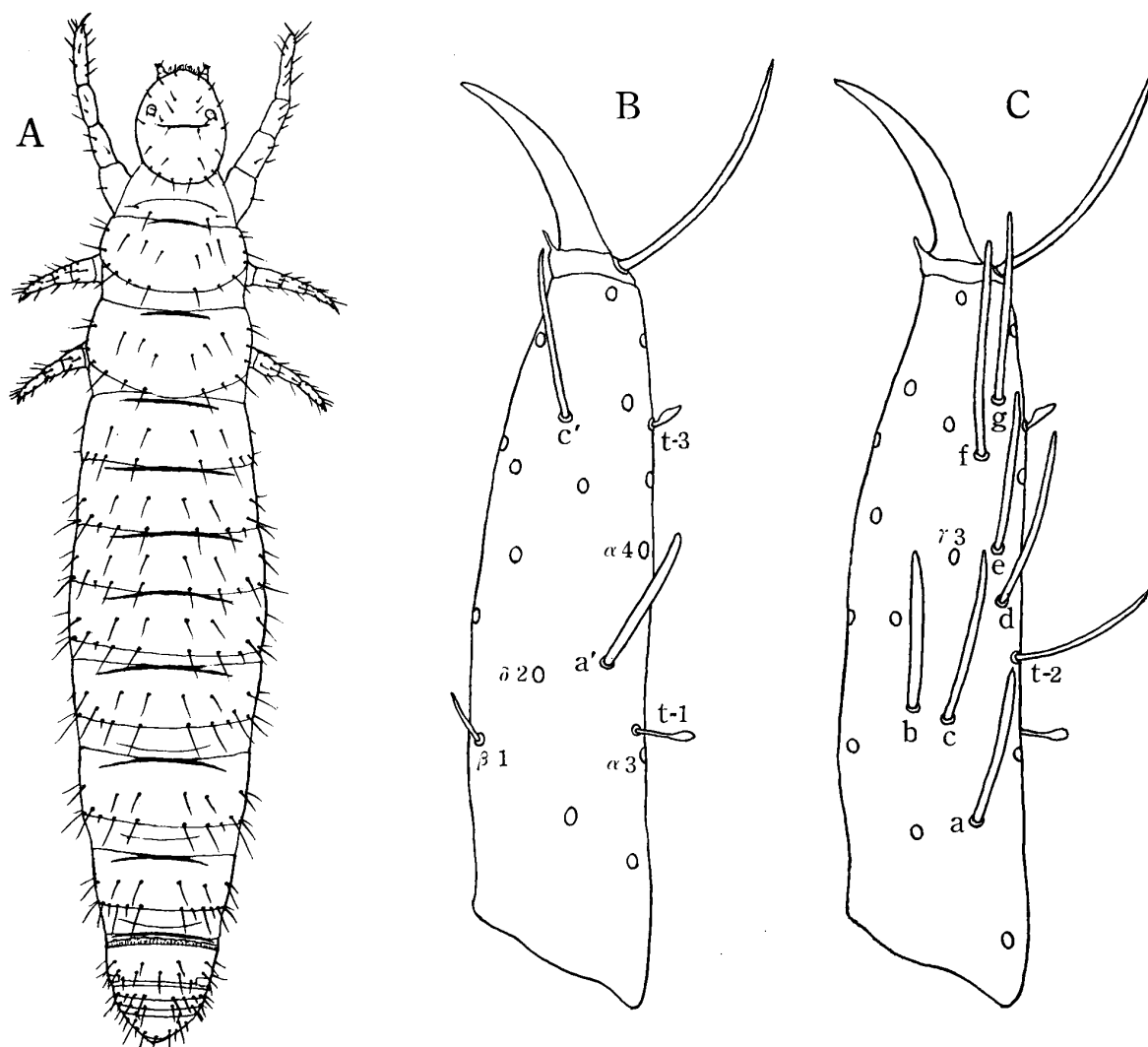


Fig. 1. *Sugaentulus masumii* gen. et sp. nov. — A, Dorsal view; B, foretarsus, interior view; C, the same, exterior view.

posterior setae, all such accessory setae as P 2a and 4a being very short, sensilla-like. On abd. VIII, striate band distinct; comb not protruding posteriorly. Abd. stern. I–VII with three anterior setae, A c and 2; stern. VIII with double rows of setae, 4 middle and 2 posterior. Abdominal appendages II–III with two setae, the apical one subequal to 2/3 of the subapical in length.

Notes. As mentioned in the introduction of this paper, the present new genus shows a strange combination of fundamental characters from the two phylogenetic lines of genera, those of *Acerentulus* and *Acerella*, that is, the body chaetotaxy and the shape of foretarsal sensilla *t-1* are the same as those in the former, whereas the position of foretarsal sensillae, the abdominal appendages and the comb on the eighth abdominal segment show the characteristics of the latter. These two phylogenetic

groups must have been derived from a common ancestral stock, and their extreme specialization is represented by *Silvestridia* and its direct relatives in the *Acerentulus* group and by *Acerentomon* and *Nipponentomon* in the *Acerella* group. The former group flourishes in tropical areas, while the latter is predominant in the cool temperate. All the genera taxonomically intermediate between the two groups, such as *Proacerella* and *Tuxenentulus*, are found in areas climatically between the two extreme regions, and the present genus also falls in this category.

Sugaentulus masumii IMADATÉ, sp. nov.

(Figs. 1–3)

Specimens examined. 3 ♂♂, 7 ♀♀ and 2 preimagines (♂), Kohirazawa (deciduous broadleaved forest (*Quercus serrata*—*Castanopsis crenata*), 140°19' E, 33°34' N, 25 m alt., Warmth Index 89 month/degrees), Kyôwa-chô, Senpoku-gun, Akita Pref., 12–XI–1976, collected by G. IMADATÉ.

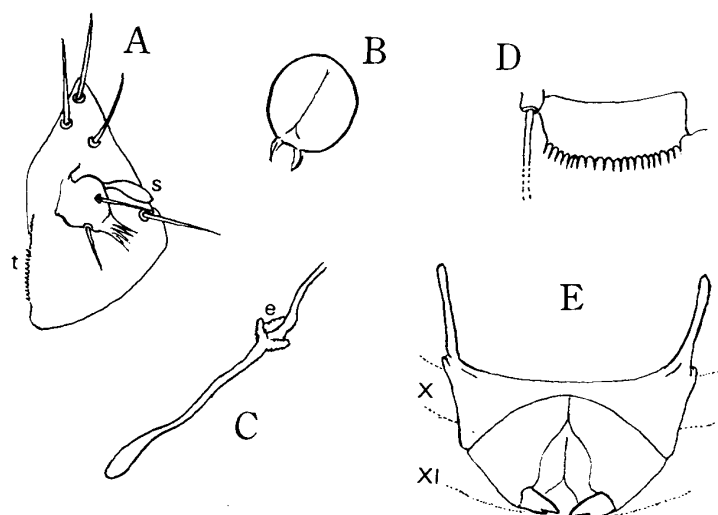


Fig. 2. *Sugaentulus masumii* gen. et sp. nov. — A, Labium: s, sensilla, t, row of fine teeth; B, pseudoculus; C, canal of maxillary gland: e, extra appendix; D, comb on abdomen VIII; E, female squama genitalis.

Body length 1,000–1,200 μ in expanded adults (ca. 900 μ in p.i.). Head oval; pseudoculus (Fig. 2 B) small, $PR \doteq 13$; mouthparts similar to those of *Imadateiella*; labium with a row of fine teeth along the inner edge (t in Fig. 2 A); labial palpus with a tuft of setae at apex, sensilla upon labial palpus broad (s in Fig. 2 A); canal of maxillary gland with an extra appendix (e in Fig. 2 C).

Foretarsus 78–84 μ in length (68–70 μ in p.i.); claw 23–25 μ , $TR \doteq 3.4$; empodium very short, $EU \doteq 0.08$; S-shaped seta a little longer than claw (Fig. 1 B–C). Dorsal sensilla *t-1* claviform; *t-2* thin and gently bowed; *t-3* small and lanceolate; exterior sensilla *a* somewhat thick; *b* broad, the apex reaching the base of γ 3; *c* at the same row as *b*, and a little longer than *b*; *d* close to *e*, a little proximal to γ 3; *e* slightly shorter

than *d*; *f* and *g* very close to each other, their apices fairly surpassing the tarsus; interior sensilla *a'* at about the same level as *t*-2; *b'* absent; *c'* slightly surpassing the tarsus; interior seta β 1 very short. Middle tarsus 33–35 μ in length; claw 20–21 μ ; hind one 38–39 μ ; claw 21–23 μ .

Abdominal appendage I two-segmented; appendages II and III unisegmented, with two setae, the apical one subequal in length to 2/3 of the subapical (Fig. 3 B–C). Striate band on abdomen VIII not reduced, the striae being very distinct; fine striae visible at the anterior edge of abd. stern. IX. Comb on abd. VIII consisting of about 20 teeth, with the posterior margin almost straight, not protruding posteriorly (Fig. 2 D).

Male squama genitalis normal; female one with stout acrostylus, apically bipartite (Fig. 2 E).

Table 1. Chaetotaxy of *Sugaentulus masumii* gen. et sp. nov.

		Dorsal		Ventral	
Thorax	I	4	1, 2	$\frac{4-4}{6}$	A 1, 2, M 1, 2 P 1, 2, 3
	II	$\frac{4-2}{14 (16)}$	A 2, 4, M P 1, 1a, 2, 2a, 3, 4, 5, (5a)	$\frac{5-2}{4}$	A c, 1, 3, M P 1, 2
	III	$\frac{4-2}{14 (16)}$		$\frac{7-2}{4}$	A c, 1, 2, 3, M P 1, 2
Abdomen	I	$\frac{6}{10}$	A 1, 2, 5 P 1, 2, 2a, 3, 5	$\frac{3}{4}$	A c, 2 P 1, 2
	II–III	$\frac{8}{14}$	A 1, 2, 4, 5 P 1, 2, 2a, 3, 4 4a, 5	$\frac{3}{5}$	A c, 2 P c, 1, 2
	IV–VI	$\frac{8}{14}$		$\frac{3}{8}$	A c, 2 P 1, 1a, 2, 3
	VII	$\frac{8}{16}$	A 1, 2, 4, 5 P 1, 1a, 2, 2a, 3, 4, 4a, 5	$\frac{3}{9}$	A c, 2 P c, 1, 1a, 2, 3
	VIII	$\frac{6-7}{8}$	A 1, 3, 5, Mc, 2, 3, 4 P 1, 2, 3, 4	$\frac{4}{2}$	1, 2 P
	IX	12	1, 2, 3, 3a, 4, 5	4	1, 2
	X	10	1, 2, 3, 4, 5	4	
	XI	6	1, 2, 3	6	1, 2, 3
	XII	9		6	

Chaetotaxy (Table 1, Fig. 3 A, D and E) similar to that of *Acerentulus*. Thoraces II and III each with two pair of dorsal anterior setae, A 2 and 4; dorsal posterior setae P 5a on these segments rudimentary; ventral anterior setae on thorax II consisting of only five setae, A c, 1 and 3; A 2 absent.

Abdominal tergites I–VI without posterior accessory setae P 1a; on terg. II–VI, posterior principal setae P 3 situated a little anterior to the other posterior setae, and the four pairs of anterior setae consisting of A 1, 2, 4 and 5 present; stern. I–VII each

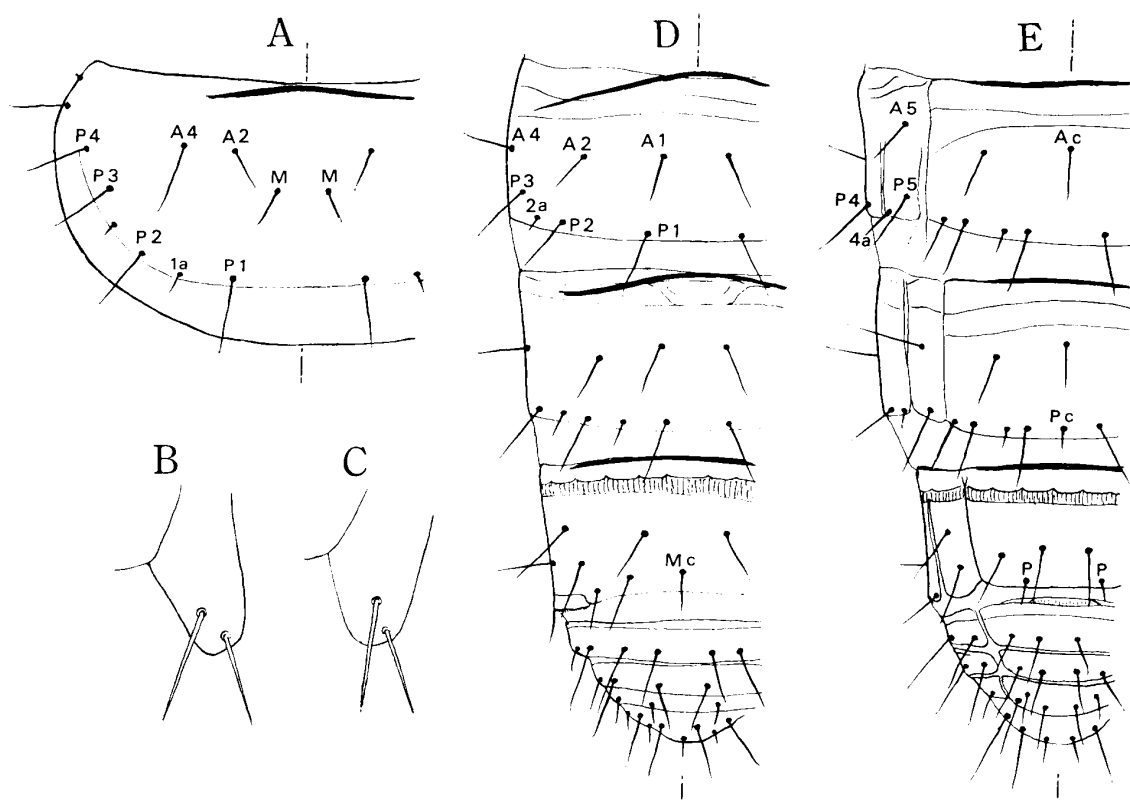


Fig. 3. *Sugaentulus masumii* gen. et sp. nov. — A, Dorsal chaetotaxy of thorax III; B, abdominal appendage II; C, abdominal appendage III; D, dorsal chaetotaxy of abdomen VI-XII; E, ventral chaetotaxy of abdomen VI-XII.

with three anterior setae, A c and 2; stern. VIII with double rows of setae, 4 middle and 2 posterior; terg. VIII with middle central seta M c instead of M 1.

Type-series. Holotype: ♂, allotype: ♀, paratypes: 2 ♂♂ and 6 ♀♀, Kohirazawa, Kyôwa-chô, Senpoku-gun, Akita Pref., 12-XI-1976, collected by G. IMADATÉ.

Notes. In the present species chaetotaxial abnormality seems very rare. Only an exception is the asymmetric absence of A 2 on abdominal tergite VII in one of the females examined. In the preimagines, P 2 on abdominal sternite I are always lacking, and A c on stern. III, P c on stern. VII, etc., are absent in one of them.

From the soil samples in which this new species was found, four other species of proturans were also met with. They are: *Yamatentomon yamato*, *Filientomon takanawanum*, *Tuxenentulus ohbai* and *Berberentulus morikawai*.

References

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